### TENT COOPERATION TREA /

#### From the INTERNATIONAL BUREAU

# PCT

#### **NOTIFICATION OF ELECTION**

(PCT Rule 61.2)

To:

United States Patent and Trademark

Office (Box PCT) Crystal Plaza 2 Washington, DC 20231

ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year)	
21 December 1998 (21.12.98)	

International application No.
PCT/US98/03197

International filing date (day/month/year) 05 May 1998 (05.05.98) Applicant's or agent's file reference CRP-144PC

Priority date (day/month/year) 05 May 1997 (05.05.97)

**Applicant** 

SAMPATH, Kuber, T. et al

l	1. The designated Office is hereby notified of its election made:
١	X in the demand filed with the International Preliminary Examining Authority on:
	03 December 1998 (03.12.98)
	in a notice effecting later election filed with the International Bureau on:
	2. The election X was
	was not
	made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland

Authorized officer

N. Masson

Telephone No.: (41-22) 338.83.38

Facsimile No.: (41-22) 740.14.35



## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's CRP-144		nt's file reference	FOR FURTHER ACTIO	See Noti  N Prelimina	fication of Transmittal of International ary Examination Report (Form PCT/IPEA/416)	
Internationa	l appl	cation No.	International filing date (day/m	onth/year)	Priority date (day/month/year)	
PCT/US9	8/03	197	05/05/1998		05/05/1997	
A61K38/1		ent Classification (IPC) or na	ational classification and IPC			
Applicant CREATIV	ΈB	OMOLECULES, INC.	et al.			
1. This in	tran:	ational preliminary exam smitted to the applicant a	nination report has been prepaccording to Article 36.	ared by this Ir	nternational Preliminary Examining Authority	
2. This F	REPO	ORT consists of a total of	8 sheets, including this cov	er sheet.		
b- (\$	een a see P	amended and are the ba Jule 70.16 and Section 6	sis for this report and/or she 07 of the Administrative Inst	ets containing	tion, claims and/or drawings which have rectifications made before this Authority the PCT).	
These	ann	exes consist of a total of	f sheets.			
	_		ating to the following items:			
1		Basis of the report .  Priority				
11 111		-	opinion with regard to novelty	v. inventive st	ep and industrial applicability	
١٧		Lack of unity of inventi		,		
V		Reasoned statement u		d to novelty, ii nt	nventive step or industrial applicability;	
VI	$\boxtimes$	Certain documents cit	ted			
VII	$\boxtimes$	Certain defects in the	international application			
VIII		Certain observations of	on the international application	n		
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# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US98/03197

I. E	Bas	is o	f th	e re	port
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1. This report has been drawn on the basis of (substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.):

		•	
	Des	cription, pages:	•
	1-20	)	as originally filed
	Clai	ms, No.:	
	1-52	2	as originally filed
	Dra	wings, sheets:	
	1-26	3	as originally filed
2.	The	amendments hav	e resulted in the cancellation of:
		the description,	pages:
		the claims,	Nos.:
		the drawings,	sheets:
3.		This report has b considered to go	een established as if (some of) the amendments had not been made, since they have been beyond the disclosure as filed (Rule 70.2(c)):
4.	Ado	litional observation	ns, if necessary:

- V. R asoned statem nt under Articl 35(2) with regard to nov lty, inv ntive step or industrial applicability; citations and explanations supporting such statement
- 1. Statement

Novelty (N) Yes: Claims 2, 15-18, 20-21, 23-24, 29-33, 40

No: Claims 1, 3-14, 19, 22, 25-28, 34-39, 41-52

Inventive step (IS) Yes: Claims -----

No: Claims 1-52

Industrial applicability (IA) Yes: Claims 1-52 (see section V. 4.)

No: Claims -----

2. Citations and explanations

see separate sheet

#### VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

#### VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

#### Section V

1. Reference is made to the following documents:

D1: Journal of the American Society of Nephrology, vol. 7, no. 9, page 1867, 1996

D2: WO 93 05751 A

D3: WO 93 04692

D4: WO 94 03200 A

2. Novelty according to Article 33(2) PCT

2.1 The examination with respect to novelty was performed under the following presumptions:

The term "..<u>renal</u> therapeutic agent.." in claims 1-7, 13-14, 37-45 and 51-52 is not regarded as being a distinguishing feature, since the substances are already known in therapy. This term does not further characterize claimed additional medical uses.

Claims 1-4 and 39-42 are interpreted in the sense, that the polypeptides selected represent either the group consisting of OP <u>or</u> BMP, by using the term "..OP/BMP.."

2.2 Document D1 (abstract) refers to a preclinical trial with nephrectomized rats and the study of the effect of systemically applied OP-1/BMP-7, a member of the TGF-beta subfamily, upon delay or halt progression of end stage renal failure. Recombinant human OP-1 at doses of 1, 10 and 100 µg / kg were administered 3 times per week intravenously beginning 3 weeks after surgery and continued for 10 to 24 weeks. The results show that 10 or 100 µg / kg treated groups significantly decreases the elevated serum blood urea nitrogen (BUN) and creatinine values from 2 weeks after the initiation of OP-1 therapy. Histological evaluation of kidney tissue sections showed cytoprotection against glomerular sclerosis and there were also evidence of preservation of proximal and distal tubular structures. The authors suggest, that OP-1 may play a role in cell survival and tissue morphogenesis and, as such, may provide a basis for the treatment of chronic renal disease.

These disclosures are novelty destroying to claims 1, 4, 5, 6, 13, 14, 19, 22, 26, 27, 35-38 and 39, 42-44 and 51.

Document D3 (claims 1, 24, 26-29 on page 145-147) relates to a method for alleviating and protecting the inflammatory response induced in a mammal following tissue injury, including the renal tissue, by means of administering morphogens, recruited i.a. from OP-1, OP-2, BMP3, BMP5 and BMP6, or morphogens which comprise an amino acid sequence having greater than 60% or 65% amino acid identity or at least 70% or 80% homology with one of the sequences as selected from the above mentioned morphogens.

Examples 11, 12 and 14 (page 88-89; 92) refer to specific inhibitory effects of said morphogens in inflammatory response. Said morphogens may be provided to an individual by any suitable means, i.a. by the oral or parenteral (intravenous, intraperitoneal) route (page 51, line 4-9).

These disclosures take the novelty of claims 3, 5-12, 14, 25-28, 41, 43-50 and 52.

Document D4 (page 8, line 4-17) is directed to the use of morphogens for maintaining neural pathways in a mammal, including the enhancement of the survival of neuronal cells. Said morphogens are suitable to repair said pathway or to inhibit additional damage thereto.

Said morphogen is preferably provided to the site of application (page 10, line 18-20). Further on, said agents are useful for providing neuroprotective effects to alleviate neural pathway damage associated with the body's immune/inflammatory response to an initial injury to nerve tissue (page 14, line 15-19).

Said morphogen comprises an amino acid sequence sharing at least 70 % homology (claim 23, page 157) or 80% homology (claim 24, page 157) with one of the sequences selected from the group of i.a. from OP-1. Said morphogens can also comprise an amino acid sequence having greater than 60% (claim 25, page 158) or 65% (claim 26, page 158) amino acid identity with the sequence defined by OP-1.

These disclosures anticipate subject-matter of claims 3-12, 14, 34, 41-50 and 52.

Claims 2, 15-18, 20-21, 23-24, 29-33 and 40 are regarded as being novel, since none of the prior art documents discloses corresponding, particular subjectmatter.

Inventive step according to Article 33(3) PCT 3.

Document D1 differs from claims 2, 15-18, 20-21, 23-24, 29-33 and 40 of the application in that:

- said OP/BMP agent is not disclosed as being useful in delaying the need of 1) dialysis or reducing the frequency of dialysis (claims 2, 40),
- said renal disease is not further characterized by the increased rate of BUN 2) or serum creatinine (claims 15-18),
- said renal failure is due to an intrinsic renal cause but not to a pre-renal-3) (claim 20) or post-renal- (claim 21) cause,
- said renal patient has not received a kidney transplant (claim 23) or 4) possesses only one kidney (claim 24),
- said method of administration does not in particular refer to the application 5) into the renal capsule (claim 29) or by means of a stent (claims 31-33),

In view of D1, the objective technical problem of the application is to find further renal applications for the known morphogens as well as suitable routes of administration.

#### Claims 2, 40, 20-21 and 23-24

The solution according to claims 2, 40, 20-21 and 23-24 of the application is to use said agents also for treating dialysis patients or patients suffering from renal diseases caused by pre- or post- renal disturbances or treating particular patients with only one kidney or which are transplant recipients.

The proposed solution is however not inventive, because it is already known from document D1, that said OP-1 shows a cytoprotective effect in the kidneys, resulting in the preservation of renal structures. Further on, the authors suggest that said OP-1 may also provide a basis for the treatment of chronic renal disease. From this teaching, the person skilled in the art would be obviously led to consider not only the therapy of acute renal failure with said morphogen, but also chronic disease states, like dialysis, or particular disease states in the context with

patients having only one kidney available or kidney recipient patients. These patients are characterized by an increased need for renal cytoprotection. Document D1 already suggests such a cytoprotection by means of administering the morphogen OP-1.

Further on, document D2 suggests the use of said agents in the treatment of chronic renal diseases:

Document D2 (abstract; page 12, 15-16) is directed to the treatment of bone diseases by means of administering to a patient a suitable morphogen, i.a. OP-1, OP-2, BMP-3, BMP-4, BMP-5 and BMP-6, which increases the bone mass or prevents bone loss. It is referred to said agents as being useful in the treatment of any other disease which causes or results in skeletal defects, including i.e. chronic renal failure and other kidney diseases, particularly those requiring dialysis (page 8, line 25-31 and claim 47, page 147).

#### **Claims 15-18**

The further characterisation of said renal diseases by means of defining the increased rate of Bun- or serum creatinine levels is not regarded as involving an inventive step, since the skilled artisan would be led by the teaching of D1 to treat any disease state of renal failure or renal conditions affording dialysis, independently of the degree of severity.

#### **Claims 29-33**

Subject matter of claims 29-33 does equally not involve an inventive step, as the different modes of administration are considered as obvious modifications. Document D2, for instance, suggests already the administration of said morphogens (page 49, line 1) by means of a directly, i.e. locally, application. With this respect, D2 refers to i.a. the subcutaneously implantation of OP-1 in a mammal, which resulted in an induced endochondral bone formation (page 51, line 10-12).

The use of stents according to claims 31-33 is not regarded as inventive, since the skilled person would consider this kind of administration also alternatively.

For the assessment of the present claims 1-52 on the question whether they are 4. industrially applicable, no unified criteria exist in the PCT. The patentability can

also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a

known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

#### Section VI

Following patent applications, classified as x, p-documents in the international search report, are cited:

WO 97 41880 A, published 13 November 1997, filed 6 May 1997 with the priority date of 6 May 1996 and

WO 97 41881 A, published 13 November 1997, filed 6 May 1997 with the priority date of 6 May 1996.

#### Section VII

Contrary to the requirements of rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D4 is not mentioned in the description, nor are these documents identified therein.

# PATENT COOPERATION TREATY PCT

# INTERNATIONAL SEARCH REPORT

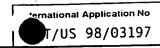
(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference FOR FURTHER see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.					
CRP-144PC	ACTION				
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)			
PCT/US 98/03197	05/05/1998	05/05/1997			
Applicant					
CREATIVE BIOMOLECULES, INC	C. et al.				
This International Search Report has been according to Article 18. A copy is being tra	n prepared by this International Searching Auth ansmitted to the International Bureau.	ority and is transmitted to the applicant			
This International Search Report consists  It is also accompanied by a cop	of a total of sheets.  y of each prior art document cited in this report.				
1. X Certain claims were found un	searchable (see Box I).				
2. Unity of invention is lacking (	see Box II).				
international search was carried	ntains disclosure of a nucleotide and/or amind out on the basis of the sequence listing did with the international application.  In this initial initial and a statement to the matter going beyond the disclosure in the	mational application, ne effect that it did not include			
Tra	anscribed by this Authority				
	e text is approved as submitted by the applicant e text has been established by this Authority to I				
the	e text is approved as submitted by the applicant e text has been established, according to Rule is ox III. The applicant may, within one month from earch Report, submit comments to this Authority	38.2(b), by this Authority as it appears in the date of mailing of this International			
be	blished with the abstract is: suggested by the applicant. cause the applicant failed to suggest a figure. cause this figure better characterizes the inven	None of the figures.			



oternational application No. PCT/US 98/03197

Box I Obs rvations where ertain claims w re found unsearchable (C ntinuati n of it m 1 f first sh et)
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
1. X Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
Although claims $1$ - $38$ are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
B x II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)
This International Searching Authority found multiple inventions in this international application, as follows:
As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
Remark on Protest  The additional search fees were accompanied by the applicant's protest.  No protest accompanied the payment of additional search fees.



Δ	CL ASSIF	FICATION OF SUBJECT MATTI	EΑ
	DC 6	Δ61K38/18	

According to International Patent Classification (IPC) or to both national classification and IPC

#### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61K C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

Category °	Citation of document, with indication, where appropriate. of the relevant passages	Relevant to claim No.
X	VUKICEVIC ET AL.: "Recombinant human OP-1 (BMP-7) prevents rapid loss of glomerular function and improves mortality associated with chronic renal failure" JOURNAL OF THE AMERICAN SOCIETY OF NEPHROLOGY, vol. 7, no. 9, 1996, Nov 3-6 page 1867 XP002038677 see abstract no. A3102	39,40, 43-52
X	WO 93 05751 A (CREATIVE BIOMOLECULES, INC.) 1 April 1993 see page 8, line 23 - line 31 see page 11, line 6 - line 19 see claims 45-52	39,40, 43-52

X Further documents are listed in the continuation of box C.	X Patent family members are listed in annex.
*A* document defining the general state of the art which is not considered to be of particular relevance  *E* earlier document but published on or after the international filing date  *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  *O* document referring to an oral disclosure, use, exhibition or other means  *P* document published prior to the international filing date but later than the priority date claimed	<ul> <li>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</li> <li>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</li> <li>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combined with one or more other such documents, such combination being obvious to a person skilled in the art.</li> <li>"&amp;" document member of the same patent family</li> </ul>
Date of the actual completion of the international search  3 August 1998	Date of mailing of the international search report
Name and mailing address of the ISA  European Patent Office, P.B. 5818 Patentiaan 2  NL - 2280 HV Rijswijk  Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  Fax: (+31-70) 340-3016	Alvarez Alvarez, C

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/Continu	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
tegory °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	WO 93 04692 A (CREATIVE BIOMOLECULES, INC.) 18 March 1993 see claims 1,24,26-30,56; examples 5,11,12,14	41,43-52
<	WO 94 03200 A (CREATIVE BIOMOLECULES, INC.) 17 February 1994 see page 12, line 20 - page 13, line 18 see claims 1,2,23-27	42-52
X,P	WO 97 41880 A (CREATIVE BIOMOLECULES, INC.) 13 November 1997 see the whole document	39,40, 43-52
Х,Р	WO 97 41881 A (CREATIVE BIOMOLECULES, INC.) 13 November 1997 see claims 1,8,50-56	39,40, 43-52
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International Application No CT/US 98/03197

Patent family Publication Publication Patent document member(s) date date cited in search report 30-05-1996 01-04-1993 ΑU 669127 B WO 9305751 Α ΑU 2564592 A 05-04-1993 ΑU 670558 B 25-07-1996 3176293 A 27-04-1993 ΑU 12-09-1992 CA 2104678 A 01-04-1993 CA 2116559 A 18-03-1993 CA 2116562 A EP 0601106 15-06-1994 EP 0601135 A 15-06-1994 08-12-1994 6510989 T JP JP 7502021 T 02-03-1995 WO 9304692 A 18-03-1993 12-08-1997 5656593 A US US 5650276 A 22-07-1997 US 5674844 A 07-10-1997 US 5741641 A 21-04-1998 US 5739107 A 14-04-1998 US 5733878 31-03-1998 US 5652337 29-07-1997 US 5652118 A 29-07-1997 678345 B 29-05-1997 ΑU 05-04-1993 AU 2862492 A 20-11-1997 AU 3604097 A 18-03-1993 2116560 A CA EP 0601129 A 15-06-1994 25-02-1998 EP 0825442 A 24-11-1994 JP 6510432 T 9305172 A 18-03-1993 WO 13-01-1998 5707810 A US 165213 15-05-1998 AT 678380 B 29-05-1997 AU 4795193 A 03-03-1994 ΑU 24-10-1996 AU 673006 B AU 4995593 A 03-03-1994 2141555 A 17-02-1994 CA17-02-1994 CA2141556 A 28-05-1998 DE 69318166 D 17-05-1995 EP 0652953 A 12-07-1995 EP 0661933 A 26-10-1995 JP 7509611 T

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WO 9741881	Α	13-11-1997	AU AU WO	2832297 A 2933997 A 9741880 A	26-11-1997 26-11-1997 13-11-1997